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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,535	06/15/2006	Andrei V. Belikov	0032.0007US1	7647

29127 7590 10/08/2009

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EXAMINER	
NELSON, MATTHEW M	

ART UNIT	PAPER NUMBER
3732	

MAIL DATE	DELIVERY MODE
10/08/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,535	BELIKOV ET AL.	
	Examiner	Art Unit	
	Matthew M. Nelson	3732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *62-67,75-85,87 and 89-96* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 5-8,12-15,17-20,23-25,29,31,35-37,44-48,62-67,75-85,87,89-96,99,101-103,108,109,111,112 and 116.
Continuation of Disposition of Claims: Claims withdrawn from consideration are 5-8,12-15,17-20,23-25,29,31,35-37,44-48,99,101-103,108,109,111,112 and 116.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :6/19/2006, 2/11/2009, 7/16/2009.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 62-67, 75-85, 87, 89-96 in the reply filed on 6/15/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 5-8, 12-15, 17-20, 23-25, 29, 31, 35-37, 44-48, 97, 99, 101-103, 108-109, 111-112, 116 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/15/2009.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because it contains legal phraseology such as "comprises" and "comprising". Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 91 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 91 recites the limitation "the compound" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 62-67, 92-94, 96 are rejected under 35 U.S.C. 102(b) as being anticipated by Wolbarsht et al. (US 5,267,856).

10. Wolbarsht shows a method of hard tissue modification comprising selectively heating a porous layer of hard tissue (tooth enamel) to cause the porous layer to fuse

(col. 1, lines 30-35) and have a composition differing from that of the hard tissue originally (crystals have been fused). A pulsed laser is used to heat the porous layer to a temperature higher than a melting temperature of hard tissue but less than 2000 degrees Celsius (col. 1, lines 30-35; col. 5, lines 22-68). The thickness of the porous layer is dependent on the enamel and this layer is formed before heating of the tissue (col. 3, lines 49-65). The porous layer is cooled with a cooling fluid such as water (col. 2, lines 14-26). The layer is impregnated with particles before heating (col. 3, lines 49-65).

11. Claims 62, 75-77, 79-83, 87, 89-90, 94 are rejected under 35 U.S.C. 102(b) as being anticipated by Levy (US 5,194,005).

12. Levy shows a method of hard tissue modification comprising impregnating a porous layer of hard tissue such as a carious lesion, open dentine, cementum, bone, or cartilage (col. 1, lines 16-39) with particles (hydroxyapatite solution) having a fluidity temperature about the same/higher as a melting temperature of the hard tissue of the porous layer (col. 2, lines 44-57) and selectively heating the porous layer to a temperature higher than the melting temperature of the hard tissue, causing the hard tissue and the particles to fuse (col. 3, lines 18-25). With respect to claims 76-77, 82-83, 87 the particles are inorganic particles that may be crystal, ceramic, glass, or their mixture (hydroxyapatite solution). With respect to claims 79, 81, selective heating comprises heating by acoustic energy, electromagnetic energy, light energy, microwave energy, radio frequency, electric current, or combinations thereof (col. 3, lines 6-25).

With respect to claims 87, 89, the filler material is fluidified before being impregnated into the porous layer (hydroxyapatite solution; col. 2, lines 44-57).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 78, 84-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levy.

15. Levy discloses the device as previously described above, but fails to show the particles made of Na2O-Al2O3-SiO2, Ca(PO3), CaF2, Ca10(PO4)6(OH)2, and Ca10(PO4)6F2, quartz glass, sital glass, crystals of quartz, diamond, sapphire, topaz, amethyst, zircon, agate, granite, spinel, fianite, tanzanite, tourmaline, and combinations thereof.

16. It would have been an obvious to one of ordinary skill in the art at the time of invention to choose any of these particles as the inorganic particles since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

17. Claims 91, 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levy in view of Auge, II (US 2002/0022846).

18. Levy discloses the device as previously described above, but fails to show forming the porous layer by applying a compound such as acid.

19. Auge teaches a method of hard tissue modification comprising chemically treating the hard tissue with acid ([0022]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Levy's method of hard tissue modification by having the step of acid etching of Auge in order to chemically treat the bone surface and provide a better fusing or welding surface if desired.

20. Claims 92-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levy in view of Wolbarsht.

21. Levy discloses the device as previously described above, but fails to show following selectively heating with active control cooling by water.

22. Wolbarsht teaches a method of hard tissue modification as stated above and shows actively cooling the hard tissue after selective heating wherein water is used (col. 2, lines 14-26). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Levy's method of hard tissue modification by including the active water cooling of Wolbarsht in order to cool down the tooth after each laser pulse and allow drying of the tooth before the next pulse.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew M. Nelson whose telephone number is (571)

270-5898. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on (571) 272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MMN/

/Cris L. Rodriguez/
Supervisory Patent Examiner, Art Unit 3732